SFB/TRR 21 - Seminar
28. Juli 2008, Tübingen

Prof. Dr. Ruslan Prozorov

(Department of Physics & Astronomy and Ames Laboratory
Iowa State University, Ames, Iowa, U.S.A.)

Dynamics of Strongly Correlated Vortex Matter in Type-II Superconductors

The spatio-temporal evolution of the vortex density in hard type-II superconductors is controlled by highly nonlinear thermo-electrodynamic processes related to vortex motion and heat transfer to the material itself and to the environment. When the conditions are right this may lead to extreme consequences, such as large-scale vortex avalanches or even total collapse of the critical state. Examples of such behavior in bulk and thick films of niobium as well as magnesium diboride will be discussed. The opposite extreme case of strongly correlated vortex dynamics in the limit of the vanishing driving force is non-logarithmic creep and self-organized critical behavior of vortex matter. Magneto-optical and miniature Hall-probe array imaging will be used to illustrate the presentation.

28. Juli 2008, 11:15 Uhr

Universität Tübingen, Raum D4 A19
Auf der Morgenstelle 14, 72076 Tübingen

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